The facultative life cycle may characterize a number of other desert herbaceous species usually considered perennial, but which perhaps may in fact flourish intermittently as biennials or annuals during periods following extremes in amount or timing of rainfall. Other perennials in the Test Site flora suspect of having a facultative life cycle are especially the species of *Sphaeralcea, Mirabilis pudica* Barneby, and *Eriogonum inflatum* T. & F., in which large and conscpicuous populations one year are often absent the following season.

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Literature Cited

Barneby, R. C. 1964. Atlas of North America Astragalus. Mem. New York Bot. Gard. 13(2).

Beatley, J. C. 1969. Vascular plants of the Nevada Test Site, Nellis Air Force Range, and Ash Meadows (northern Mojave and southern Great Basin deserts, south-central Nevada). UCLA 12–705. Lab. Nucl. Med. & Rad. Biol., Univ. Calif. Los Angeles.

REVIEWS

Principles and Methods of Plant Biosystematics. By Otto T. Solbrig. xii + 226 pp. MacMillan Company, New York. 1970. $9.95.

Solbrig states that his objective has been "to present the theoretical and technical aspects of systematics that are not adequately covered in most of the presently available text-books." Within his self-imposed limits and the limitations of space (possibly imposed by the publisher) he has succeeded remarkably well. As reflected in the title and the quoted excerpt from the preface, the book provides a synopis of current principles and methods used by practicing biosystematists. The book is in two parts. The first summarizes the current rationale behind biosystematic research; the second briefly reviews various "modern" data-gathering techniques employed by biosystematists. The latter section is well suited to development of a series of laboratory exercises to complement the discussions in the former section.

Organization of material, format, illustrations, etc. are very good and the breadth of treatment of particular topics is generally uniform and adequate for elementary students. For advanced classes the discussions form a sound base from which more thorough analyses of particular principles or methods may be developed. The following list of chapter headings indicates the scope of the text: Part I—Introduction and Historical Background, Synthetic Theory of Evolution, Patterns of Phenetic Variability, Breeding Systems, Speciation, Hybridization, and The Species Problem and Classification; Part II—Genetics, Cytology, Chemistry, Mathematics and Statistics, and Conclusion.

Most of the discussions of theoretical points are clear, concise, and well supported through reference to published work. There are, however, several distressing syntactical monstrosities which should never have reached the printed page.

"Under such conditions the plants in each population that are most dissimilar in their requirements can grow where a minimum number of plants of the other population can grow." p. 85.

"Biological phenomena are never undimensional." p. 109.

"The important thing is not to make biosystematic or chemical conclusions inconsistent with the data at hand." p. 162.

". . . what constitutes a 'character' is therefore somewhat irrelevant to the problem at hand. What is important is to be sure when establishing relationships that comparable characters are considered." p. 183.

Further, there is an alarming number of spelling errors and minor errors of fact, e.g., *"annus"* for *annuus* (pp. 7 & 8), "$6^{(10^4)} = 6^{40}$" (?) (p. 21), "subtrite for subtribe (p. 38), "Macmillan" for McMillan (pp. 41–43—the work of the publisher?), *"chrysosthoma"* for *chrysostoma* (p. 112), herbaceous Baptisias are said to be shrubby (p. 164), "betalins" for betalains (p. 164 and glossary). It is hoped that such errors will be corrected in future printings.

It is unfortunate that in such a small book several pages are wasted in duplicating material. An adequate page of Contents is followed by four pages of Detailed Contents. "Genetic system" is defined in the text on p. 49 and again in a footnote on p. 157. The glossary of some twelve pages could easily have been left out and needed definitions made parenthetically. "Chromatin" is defined both in the glossary *and* parenthetically in the text (p. 143). Additionally, many of the glossary entries are more misleading than informative: An "achaene" (sic) is described as dehiscent while no mention of dehiscence is made in the entry for "capsule". "Chiasma" is said to be "an exchange of partners . . .". "Relationship. A statement about two or more objects that is either true or false."

While the general coverage of topics germane to biosystematics is quite good, there are a few conspicuous omissions. There is no discussion of apomixis even though this phenomenon is of major importance in the biosystematics of many genera of flowering plants. Ecotypic variation is very well treated but there is no mention of clinal variation. Finally, perhaps a minor point, there is no mention of the importance of voucher specimens for documenting biosystematic research.

Apart from the points raised above, I feel that the author has realized his objective. No other textbook approximates to such a neat synopsis of current thought and method in today's biosystematics. Solbrig is to be congratulated for recognizing an empty niche and capably filling it. It will be interesting to see whether his text will succeed or be displaced by competitors, which are sure to come.—John L. Strother, Herbarium, University of California, Berkeley.

The Native Cacti of California. By Lyman Benson. xii + 243 pp., illus. Stanford University Press. 1969. $7.95.

Lyman Benson, leading specialist in the taxonomy of the cacti of the United States and Canada, has produced a well-organized and thoroughly illustrated book on the more than 50 different taxa of this family that occur naturally within California. This compact publication will appeal to a broad range of readers.

A two and one-half page key introduces the nine genera that are covered. Each genus is treated in detail with a description and, where needed, a key to the species and varieties. The individual taxa are described and their distribution within the state is mapped; nearly all are also illustrated, often more than once.

Four color plates by L. C. C. Krieger are superb; the colors, shading, detail, and accuracy may well be the best that have been employed to illustrate cacti. Also